

CLINICAL BIOMECHANICS

INDEX: VOLUME 16 2001

Volume 16 Number 1 January 2001

REVIEW PAPER

- 1 Biomechanics of the cervical spine Part 2. Cervical spine soft tissue responses and biomechanical modeling
N. Yoganandan, S. Kumaresan and F.A. Pintar
- 28 Intervertebral disc herniation: studies on a porcine model exposed to highly repetitive flexion/extension motion with compressive force
J.P. Callaghan and S.M. McGill
- 38 Female and male trunk geometry: size and prediction of the spine loading trunk muscles derived from MRI
W.S. Marras, M.J. Jorgensen, K.P. Granata and B. Waiand
- 47 Injury initiation and progression in the anterior cruciate ligament
A.B. Zavatsky and H.J.K. Wright
- 54 Quantified kinematics of the injury to the posterior cruciate ligament: a computer-aided design simulation study
I.A. Karnezis, E.G. Fragkiadakis, J.M. Webb and J.R.W. Hardy
- 61 Assessment of functional knee bracing: an in vivo three-dimensional kinematic analysis of the anterior cruciate deficient knee
D.K. Ramsey, M. Lamontagne, P.F. Wretenberg, A. Valentin, B. Engström and G. Nemeth
- 71 A spring network model for the analysis of load transfer and tissue reactions in intra-medullary fixation
J.M. Egan and D.C. Marsden
- 80 A triaxial dynamometer to monitor lateral bending and axial rotation moments during static trunk extension efforts
C. Larivière, D. Gagnon, D. Gravel, A. Bertrand-Arsenault, J.-P. Dumas, M. Goyette and P. Loisel

BRIEF REPORT

- 84 Graphical presentation of the range of hip and knee rotations for clinical evaluation of gait
P.L. Cheng and M. Pearcy

Volume 16 Number 2 February 2001

REVIEW PAPER

- 87 Passive extensibility of skeletal muscle: review of the literature with clinical implications
R.L. Gajdosik

PAPERS

- 102 Neuromuscular neutral zones sensitivity to lumbar displacement rate
B.S. Elizabeth Eversull, M. Solomonow, E.E. Bing He Zhou, R.V. Baratta and M.P. Zhu
- 114 Symmetry and linearity of trunk function in subjects with non-specific low back pain
B. Tawfik
- 121 The effect of partial removal of the nucleus pulposus from the intervertebral disc on the response of the human annulus fibrosus to compression
J.R. Meakin, T.W. Redpath and D.W.L. Hukins
- 129 In vivo geometrical evaluation of Cheneau-Toulouse-Munster brace effect on scoliotic spine using MRI method
D. Périé, J. Sales De Gauzy, A. Sévely and M.C. Hobatho
- 138 Dynamic inferior stabilizers of the shoulder joint
A.M. Halder, C.G. Halder, K.D. Zhao, S.W. O'Driscoll, B.F. Morrey and K.N. An
- 144 Loosening performance of cemented glenoid prosthesis design pairs
C. Anglin, U.P. Wyss, R.W. Nyffeler and C. Gerber

- 151 **Rapid application fracture fixators – an evaluation of mechanical performance**
T.N. Gardner, H. Simpson and J. Kenwright
- 160 **The influence of inserting a Fuji pressure sensitive film between the tibiofemoral joint of knee prosthesis on actual contact characteristics**
J.-J. Liao, C.-C. Hu, C.-K. Cheng, C.-H. Huang and W.-H. Lo
- 167 **Effect of slip on movement of body center of mass relative to base of support**
J.-Y. You, Y.-L. Chou, C.-J. Lin and F.-C. Su
- 1 **ANNOUNCEMENT**

Volume 16 Number 3 March 2001

PAPERS

- 175 **Disorders in trunk rotation during walking in patients with low back pain: a dynamical systems approach**
R.W. Selles, R.C. Wagenaar, T.H. Smit and P.I.J.M. Wuisman
- 182 **MRI-derived moment-arms of the female and male spine loading muscles**
M.J. Jorgensen, W.S. Marras, K.P. Granata and J.W. Wiand
- 194 **Sit-to-stand at different periods of pregnancy**
S.-Z. Lou, C. You-Li, C.-J. Lin and U.-C. Chen
- 199 **Head movement during sudden base translations as a measure of risks for falls in the elderly**
G. Wu
- 207 **Fatigue-induced changes in decline running**
J. Mizrahi, O. Verbitsky and E. Isakov
- 213 **A dynamical systems investigation of lower extremity coordination during running over obstacles**
N. Stergiou, J.L. Jensen, B.T. Bates, S.D. Scholten and G. Tzetzis
- 222 **Augmentation of a ruptured posterior cruciate ligament provides normal knee joint stability during ligament healing**
L. Dürselen, G. Hehl, M. Simnacher, L. Kinzl and L. Claes
- 229 **Tibiofemoral joint forces during maximal isokinetic eccentric and concentric efforts of the knee flexors**
E. Kellis
- 237 **Quantitative measurement of ankle passive flexibility using an arthrometer on sprained ankles**
W. Liu, S. Siegler and L. Techner
- 245 **Mechanical properties of the human achilles tendon**
T.A.L. Wren, S.A. Yerby, G.S. Beaupre and D.R. Carter
- 252 **Prediction of strength of cortical bone in vitro by microcomputed tomography**
N.J. Wachter, P. Augat, G.D. Krischak, M.R. Sarkar, M. Mentzel, L. Kinzl and L. Claes
- 257 **Predictive value of Singh index and bone mineral density measured by quantitative computed tomography in determining the local cancellous bone quality of the proximal femur**
N.J. Wachter, P. Augat, I.P. Hoellen, G.D. Krischak, M.R. Sarkar, M. Mentzel, L. Kinzl and L. Claes

BRIEF REPORT

- 263 **Paraspinal muscle EMG fatigue testing with two methods in healthy volunteers. Reliability in the context of clinical applications**
G.A. Koumantakis, F. Arnall, R.G. Cooper and J.A. Oldham

Volume 16 Number 4 May 2001

REVIEW PAPER

- 267 **Biomechanics of the cervical spine III: minor injuries**
N. Bogduk and N. Yoganandan

PAPERS

- 276 **Comparison of axial and flexural stresses in lordosis and three buckled configurations of the cervical spine**
D.E. Harrison, D.D. Harrison, T.J. Janik, E.W. Jones, R. Cailliet and M. Normand
- 285 **Stiffness properties of the human lumbar spine: A lumped parameter model**
L. Nicholson, C. Maher, R. Adams and N. Phan-Thien
- 293 **Spinal manipulation causes variable spine kinematic and trunk muscle electromyographic responses**
G.J. Lehman and S.M. McGill

- 300 **Variability of forces applied by experienced physiotherapists during provocation of the sacroiliac joint**
U. Levin, L. Nilsson-Wikmar, K. Harms-Ringdahl and C.H. Stenström
- 307 **Measurement of the migration of a cemented hip prosthesis an in vitro test**
S.A. Maher, P.J. Prendergast and C.G. Lyons
- 315 **Accurate diagnosis of hip prosthesis loosening using a vibrational technique**
A.P. Georgiou and J.L. Cunningham
- 324 **Mechanical energy transfer during gait in relation to strength impairment and pathology in elderly women**
C.A. McGibbon, M.S. Puniello and D.E. Krebs
- 334 **High-speed subfailure stretch of rabbit anterior cruciate ligament changes in elastic, failure and viscoelastic characteristics**
M.M. Panjabi and T.W. Courtney
- 341 **Arch structure and injury patterns in runners**
D.S. Williams III, I.S. McClay and J. Hamill
- LETTER TO THE EDITOR**
- 348 **Reporting net moments about the lumbar spine**
J.H. van Dieën and I. Kingma
- REPLY BY AUTHORS**
- 349 **Joint coordinate systems of axes for coherence in reporting kinematic and kinetic data**
M. Gagnon, P. Desjardins and A. Larrive
- 351 **Erratum**

Volume 16 Number 5 June 2001

- 359 **Comparative ability of EMG, optimization, and hybrid modelling approaches to predict trunk muscle forces and lumbar spine loading during dynamic sagittal plane lifting**
D. Gagnon, C. Larivière and P. Loisel
- 373 **Tomodensitometry measurements for in vivo quantification of mechanical properties of scoliotic vertebrae**
D. Périé, J. Sales De Gauzy, C. Baunin and M.C. Hobatho
- 380 **Cervical strength of young adults in sagittal, coronal, and intermediate planes**
S. Kumar, Y. Narayan and T. Amell
- 389 **An in vivo technique for determining 3D muscular moment arms in different joint positions and during muscular activation – application to the supraspinatus**
H. Graichen, K.-H. Englmeier, M. Reiser and F. Eckstein
- 395 **A numerical solution to calculate internal-external rotation at the glenohumeral joint**
J.E. Novotny, B.D. Beynnon and C.E. Nichols III
- 401 **The effect of forearm rotation on laxity and stability of the elbow**
S. Pomianowski, S.W. O'Driscoll, P.G. Neale, M.J. Park, B.F. Morrey and K.N. An
- 408 **Elbow load during pushup at various forearm rotations**
S.-Z. Lou, C.-J. Lin, P.-H. Chou, Y.-L. Chou and F.-C. Su
- 415 **A computer model to simulate patellar biomechanics following total knee replacement: the effects of femoral component alignment**
J.H. Heegaard, P.F. Leyvraz and C.B. Hovey
- 424 **Patellofemoral joint kinetics during squatting in collegiate women athletes**
G.J. Salem and C.M. Powers
- 431 **The influence of ergometer pedaling direction on peak patellofemoral joint forces**
E. Bressel
- 438 **A comparison of knee joint motion patterns between men and women in selected athletic tasks**
R.A. Malinzak, S.M. Colby, D.T. Kirkendall, B. Yu and W.E. Garrett
- 446 **Pattern of abnormal tangential forces in the diabetic neuropathic foot**
L. Uccioli, A. Caselli, C. Giacomozzi, V. Macellari, L. Giurato, L. Lardieri and G. Menzinger
- 455 **LETTERS**

Volume 16 Number 6 July 2001

REVIEW PAPER

- 459 **The biomechanics and motor control of gait in Parkinson disease**
M.E. Morris, F. Huxham, J. McGinley, K. Dodd and R. Iansek

PAPERS

- 471 **Spinal posture and prior loading history modulate compressive strength and type of failure in the spine: a biomechanical study using a porcine cervical spine model**
J.L. Gunning, J.P. Callaghan and S.M. McGill
- 481 **Kinematics of rotational mobilisation of the lumbar spine**
R.Y.W. Lee
- 489 **A three-dimensional mathematical model of temporomandibular joint loading**
B. May, S. Saha and M. Saltzman
- 496 **Electromyographic and kinematic analysis of therapeutic knee exercises under water**
T. Pöyhönen, H. Kyröläinen, K.L. Keskinen, A. Hautala, J. Savolainen and E. Mälikä
- 505 **The effects of motion on force control abilities**
J.M. Schiffman and C.W. Luchies
- 514 **Normative data for passive ankle plantarflexion-dorsiflexion flexibility**
A.M. Moseley, J. Crosbie and R. Adams
- 522 **Mild diabetic neuropathy affects ankle motor function**
E.M. Gutierrez, M.D. Helber, D. Dealva, J.A. Ashton-Miller and J.K. Richardson
- 529 **Influence of bone mineral density, age, and strain rate on the failure mode of human Achilles tendons**
T.A.L. Wren, S.A. Yerby, G.S. Beaupre and D.R. Carter
- 535 **Medial displacement calcaneal osteotomy reduces the excess forces in the medial longitudinal arch of the flat foot**
G.A. Arangio and E.P. Salathé
- 540 **Contact stress on polyethylene components of a new rotating hinge with a spherical contact surface**
R.-S. Yang and H.-J. Lin
- 547 **ERRATUM**
- I **ANNOUNCEMENT**

Volume 16 Number 7 August 2001

PAPERS

- 549 **Mechanical load on the low back and shoulders during pushing and pulling of two-wheeled waste containers compared with lifting and carrying of bags and bins**
B. Schibye, K. Sogaard, D. Martinsen and K. Klausen
- 560 **Replacing the nucleus pulposus of the intervertebral disc**
J.R. Meakin, J.E. Reid and D.W.L. Hukins
- 566 **Finite element analysis of the mechanical behavior of a scapula implanted with a glenoid prosthesis**
B. Couteau, P. Mansat, É. Estivalézes, R. Darmana, M. Mansat and J. Egan
- 576 **Testing apparatus and experimental procedure for position specific normalization of electromyographic measurements of distal upper extremity musculature**
A.E. Barr, D. Goldsheyder, N. Özkaya and M. Nordin
- 586 **Biomechanical evidence supporting a differential response to acute ACL injury**
T.L. Chmielewski, K.S. Rudolph, G.K. Fitzgerald, M.J. Axe and L. Snyder-Mackler
- 592 **Inter-segment foot motion and ground reaction forces over the stance phase of walking**
A.E. Hunt, R.M. Smith, M. Torode and A.-M. Keenan
- 601 **Time course of stress relaxation and recovery in human ankles**
B. Duong, M. Low, A.M. Moseley, R.Y.W. Lee and R.D. Herbert
- 608 **Acceleration of the calcaneus at heel strike in neutrally aligned and pes planus feet**
W.R. Ledoux and H.J. Hillstrom
- 614 **Stress distribution of the foot during mid-stance to push-off in barefoot gait: a 3-D finite element analysis**
Weng-Pin Chen, Fuk-Tan Tang and Chia-Wei Ju
- 621 **A surgical simulation system of skin sutures using a three-dimensional finite element method**
H. Yoshida, S. Tsutsumi, M. Mizunuma and A. Yanai

BRIEF REPORT

- 627 **Reproducibility and validity of a new test protocol for measuring isokinetic trunk extension strength**
Z. Dvir and J. Keating
- 631 **Letter to the editor**
- 632 **Reply to Letter to the editor**
- I **ANNOUNCEMENTS**

Volume 16 Number 8 October 2001

REVIEW PAPER

- 635 **Anterior lateral ankle ligament damage and anterior talocrural-joint laxity: an overview of the in vitro reports in literature**
G.M.M.J. Kerkhoffs, L. Blankevoort, D. van Poll, R.K. Marti and C. Niek van Dijk

CLINICAL BIOMECHANICS AWARD 2000

- 644 **Influence of femoral anteversion on proximal femoral loading: measurement and simulation in four patients**
M.O. Heller, G. Bergmann, G. Deuretzbacher, L. Claes, N.P. Haas and G.N. Duda

PAPERS

- 650 **Trunk posture and spinal stability**
K.P. Granata and S.E. Wilson
- 660 **Functional and biomechanical assessment of the normal and rheumatoid hand**
N.K. Fowler and A.C. Nicol
- 667 **A comparison of overground and treadmill running for measuring the three-dimensional kinematics of the lumbo-pelvic-hip complex**
A.G. Schache, P.D. Blanch, D.A. Rath, T.V. Wrigley, R. Starr and K.L. Bennell
- 681 **The effect of voluntary toe-walking on body propulsion**
P.O. Riley and D. Casey Kerrigan
- 688 **Functional roles of ankle and hip sagittal muscle moments in able-bodied gait**
H. Sadeghi, S. Sadeghi, F. Prince, P. Allard, H. Labelle and C.L. Vaughan
- 696 **Gliding resistance after repair of partially lacerated human flexor digitorum profundus tendon in vitro**
C. Zhao, P.C. Amadio, M.E. Zobitz, T. Momose, P. Couvreur and K.-N. An
- 702 **Biomechanical comparison of different fixations of femur-interlocking-nails**
W. Widjaja and C. Hartung

THESIS SUMMARY

- 706 **Geometry and mechanics of the human ankle complex and ankle prosthesis design**
A. Leardini

BRIEF REPORTS

- 710 **Effect of errors in the identification of anatomical landmarks on the accuracy of Q angle values**
L. France and C. Nester
- 714 **Quantification of first tarsometatarsal joint stiffness in hallux valgus patients**
F.W.M. Faber, P.E. Zollinger, G.J. Kleinrensink, L. Damen, P.G.H. Mulder, C.J. Snijders and J.A.N. Verhaar
- 717 **Letter to the editor**
- 718 **Reply to letter to the editor**

Volume 16 Number 9 November 2001

NOVEL AWARD 2000 PAPER

- 719 **The effect of changes in foot sensation on plantar pressure and muscle activity**
M.A. Nurse and B.M. Nigg

PAPERS

- 728 **Do the intervertebral disc cells respond to different levels of hydrostatic pressure?**
W.C. Hutton, W.A. Elmer, L.M. Bryce, E.E. Kozłowska, S.D. Boden and M. Kozłowski
- 735 **A three-dimensional regression model of the shoulder rhythm**
J.H. de Groot and R. Brand
- 744 **The effect of level of spinal cord injury on shoulder joint kinetics during manual wheelchair propulsion**
K. Kulig, C.J. Newsam, S.J. Mulroy, S. Rao, J.K. Gronley, E.L. Bontrager and J. Perry
- 752 **Glenohumeral joint kinematics related to minor anterior instability of the shoulder at the end of the late preparatory phase of throwing**
J.-P. Baeyens, P. Van Roy, A. De Schepper, G. Declercq and J.-P. Clarijs
- 758 **Musculo-tendinous and joint elastic characteristics during elbow flexion in children**
C. Cornu and F. Goubel
- 765 **Even a thin layer of soft tissue may compromise the primary stability of cementless hip stems**
M. Viceconti, L. Monti, R. Muccini, M. Bernakiewicz and A. Toni

- 776 **Mechanical properties of callus in human tibial fractures: a preliminary investigation**
C.I. Moorcroft, P.J. Ogrodnik, P.B.M. Thomas and R.H. Wade
- 783 **Forces acting in the forefoot during normal gait – an estimate**
H.A.C. Jacob
- 793 **A dynamical model of locomotion in spastic hemiplegic cerebral palsy: influence of walking speed**
S.T. Fonseca, K.G. Holt, E. Saltzman and L. Fethers
- 806 **Heel to toe motion characteristics in Parkinson patients during free walking**
S. Kimmeskamp and E.M. Hennig
- 813 **Mechanisms of failed recovery following postural perturbations on a motorized treadmill mimic those associated with an actual forward trip**
T.M. Owings, M.J. Pavol and M.D. Grabner
- 820 **Letter to the editor**
- 822 **Response to Letter to the editor**
- SUPPLEMENT SECTION EMED Scientific Millennium Meeting**
- 825 **Editorial**
- 827 **Abstracts**
- I ANNOUNCEMENTS**

Volume 16 Number 10 December 2001

PAPERS

- 859 **Biomechanical examination of a commonly used measure of spasticity**
A.D. Pandyan, C.I.M. Price, H. Rodgers, M.P. Barnes and G.R. Johnson
- 866 **Dynamic loads on the upper extremities during two different floor cleaning methods**
K. Sogaard, B. Laursen, B.R. Jensen and G. Sjogaard
- 880 **The anatomic features of the radial head and their implication for prosthesis design**
W. Swiężkowski, K. Skalski, S. Pomianowski and K. Kędzior
- 888 **Effect of elbow flexion on upper extremity impact forces during a fall**
P.-H. Chou, Y.-L. Chou, C.-J. Lin, F.-C. Su, S.-Z. Lou, C.-F. Lin and G.-F. Huang
- 895 **A minimally invasive method for the determination of force in the interosseous ligament**
L.E. DeFrate, G. Li, S.J. Zayontz and J.H. Herndon
- 901 **Heel pad stiffness in runners with plantar heel pain**
K. Rome, P. Webb, A. Unsworth and I. Haslock
- 906 **Lower extremity kinetics during stair ambulation in patients with and without patellofemoral pain**
G.B. Salsich, J.H. Brechter and C.M. Powers
- 913 **Preliminary comparison of the rupture of human and rabbit anterior cruciate ligaments**
G. Azangwe, K.J. Mathias and D. Marshall

BRIEF REPORTS

- 918 **A transducer to measure isometric elbow moments**
W.D. Memberg, W.M. Murray, S.I. Ringleb, K.L. Kilgore and S.A. Snyder
- 921 **Integration of plantar soft tissue stiffness measurements in routine MRI of the diabetic foot**
A. Gefen, M. Megido-Ravid, M. Azariah, Y. Itzhak and M. Arcan
- 926 **Can interventional MRI provide an insight into the mechanics of a posterior-anterior mobilisation?**
A.H. McGregor, P. Wragg and W.M.W. Gedroyc

930 **Letter to the editor**

932 **Reply to the editor**

BOOK REVIEW

- 935 **HIP98 ©: G. Bergmann (2000)**
T. Barker
- 937 **ACL research retreat: the gender bias April 6-7, 2001**
I. McClay Davis and M.L. Ireland
- 941 **Abstracts**

